DOCUMENT RESUME

ED 322 132 SP 032 525

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TITLE Teaching Methods Effectiveness and the Acquisition of Psycho-Motor Skills.
PUB DATE Aug 90
NOTE 18p.; Paper presented at the Commonwealth and International Conference (Aukland, New Zealand, Auagust 18-32, 1990).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Athletics; Gymnastics; *Instructional Effectiveness; Learning Strategies; Methods Research; *Motor Reactions; Physical Education; *Psychomotor Skills; Secondary Education; *Teaching Methods; Volleyball

ABSTRACT

An experimental study was conducted to discover the relative effectiveness of five different instructional strategies on the acquisition of four psycho-motor skills associated with four physical sports (continuous volleying in volleyball, zig-zag dribbling in field hockey, headstand in gymnastics, and sail long jump in athletics). The subjects were 150 students of both sexes in a typical Nigeria secondary school. Findings indicated that the acquisition of psycho-motor skills was enhanced by all the instructional methods used and that no one strategy was exclusively the most effective in teaching and learning the four psych-motor skills tested. However, the combination method recorded the highest score in effectiveness for two skills, while all the five methods tested were equally effective for the learning of the other two skills. The finding that sex and instructional strategies had interacting influence on the learning of the skill led to the conclusion that both sexes require different instructional strategies to achieve maximum performance results in psycho-motor skills learning. (Author/JD)

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TEACHING METHODS EFFECTIVENESS AND THE ACQUISITION OF PSYCHO-MOTOR SKILLS

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Teaching methods effectiveness and the acquisition of psycho-motor skills.

Abstract

The experiemental study was conducted to discover the relative effectiveness of five different instructional strategies on the acquisition of four psycho-motor skills associated with four physical sports. Five teaching methods were tested for the learning of four sport skills.

One hundred and fifty students of both sexes took part in the experiement and the data were analysed using Ancova, Anova and Q. factors statistical techniques.

The results revealed that the acquisition of psycho-motor skills was enhanced by all the instructional methods used and that no one strategy was exclusively the most effective for the teaching and learning of all the four psycho-motor skills tested.

However, the combination method recorded the highest score in effectiveness for two skills while all the five methods tested were equally effective for the learning of the other two skills.

It was also revealed that sex and instructional strategies had interacting influence on the learning of the skills which led to the conclusion that both sexes required different instructional strategies to achieve maximum performance results in psycho-motor skills learning.

INTROUDCTION

The consequence of interaction between the teaching and learning processes has not always been as perfect as expected in any educational setting because of the element of complexity inherent in the processess. In consequence, educationists wanting to meeting the challenges of the dynamic changing characteristics of the processess are continually looking for effective teaching techniques for improving learning output.

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In physical eduction, various teaching methods are being explored and tried out in an attempt to help the learners to acquire physical skills rapidly.

Mosston's (1966 and 1981) spectrum of teaching styles have been extensively utilised. Each of these styles requires the teacher to adopt a way of imparting the skill to the learners. In so doing, a type of instructional measure is used to communicate message to the learners. Particularly for physical eduction, three distinctive forms of communication possibilities were identified by Cratty (1968) and Robb (1972). They are demonstration, manual/mechanical guidance and verbal instructions. The main reason for using these three types of instructions is to appeal to the learners through the visual, the kinesthetic and the auditory senses. These are the possibl nnels through which the learners can learn about psycho-motor skills ger 1972, Whitting 1973, and Fitts and Posner 1967). There are different views advanced in the writting and in the research reports on the effectiveness of each of the three instructional strategies in the learning of psycho-motor skills. Some authors and researchers such as Lawther (1968); Berlin (1959) and Rivenes (1961), have argued that the demonstration method is more effective than verbal instruction in teaching the beginners to acquire physcial skills rapidly. Verbal instruction is said to be of limited value to the beginners (Ragsdale 193 and Renshaw and Postle 1928). In support of this view, Fitts and Posner (1967), Robb (1972), and Siedentop (1976) have expressed the contention that the demonstration method is advantageous to learners at various stages of skill acquisition.

On the other hand, other researchers have emphasized the importance of verbal instruction at all stages of skills learning. Cratty (1968), (1973) suggested that a good verbal description of a skill is desirable for learners at every stage of skill learning and most especially before the commencement of practices. Sometimes this is termed pretraining instruction. This description

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should include the general directions to be followed during the process of learning. At the end of each trial, further verbal instruction may be given to enhance performance.

Dailey (1961), in a related study on psycho-motor skills learning found that manual guidance is highly effective especially when used with children suffering from a type of sensory handicap.

Cratty (1973), Lawther (1968), and Holding (1969) believe that this method is most effective with young children particularly at the initial stage of skill acquisition and to prevent bad habits from forming. Singer (1977) believes that the method is too restrictive to benefit all learners.

The above discussion revelaed that opinions differ as to which method of instruction is most effective for psycho-motor skills acquisition. This is because there are numerous skills and perhaps, they all need different approaches. However, the only area where there is a strong agreement between physical educationists and physchologists is that the combination of instructional strategies ususally result in speedier acquisition of physical skills than any of the methods used singly. This is because this approach makes the learner see the movement (visual), hear the verbal description (auditory) and 'feel' the movement (kinesthetic/proprioceptive) of the skill in any one lesson. Robb (1972), Fitts and Posner (1967) are also in favour of utilizing all the possible cues to arouse all the receptor organs of the learners. In Dailey's (1961) study however, the combination method was rated third out of five alternatives, which indicated that the combination of all methods may not always be the best method for the acquisition of all skills.

Since the introduction of Wiener's (1948) work on cybernetics, feedback has been considered as an important variable necessary for all forms of learning. The effectiveness of any form of instruction will depend greatly on the

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type and quality of feedback available to the learners, whether or not the teacher uses combination method or a single method.

Teaching Effectiveness

Teaching in general has gone through many changes and the modern trend is toward learners-centred approach. This apprach presents great challenges to the teacher with a high sense of responsibility. To be effective, therefore, the teacher must be aware of the constant changes in the curriculum and respond accordingly. One of the ways to meet the challenges of change is to continously attempt to improve teaching techniques through the exploration of various learning possibilities to achieve better results.

Another way to achieve teaching effectiveness, is for the teacher to radiate warmth to the learners, utilize instructional techniques effectively, give immediate feedback and be fully involved (Ikulayo 1982; Singer and Pease 1976). The physical education lesson must be packed with challenging activities and purposeful movements. They must be capable of helping the learners to achieve an all round educational development. Every learner should benefit from every lesson (Ikulayo, 1982).

It is the responsibility of the teacher to create fun and enjoyment in the learning situation, to set out clear objectives for the lesson and aim to achieve them. The lesson itself must be adequately prepared before hand, (Mosston, 1981). The evaluation of the lesson is essential and the teaching achievement should be evaluated through pupils performances. The learning/performance curves can be used to assess pupils' rate of learning (Magill, 1981) Knapp, 1966; and Oxendine 1963).

It is important for the teacher to practise all the available instructional strategies, experiment with different classes to discover which technique suits which class and for which skill. One type of method which may be

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found suitable with one effective for that same group on a different task. The teacher should use initiatives and select the most effective instructions for a specific situation. He should be aware of individual differences and be prepared to vary teaching approaches. Dowell (1975) in support of the last statement observed that teachers should have insight into various possibilities so that they can try out and select the best method for a given task and a given learner. Davis and Lawther (1948) also suggest that there are needs for teachers to be exposed to various methods, instructions and techniques and to try them out with different situations because various techniques are necessary to match and to adjust to the learners who vary in temperament, intelligence, interest, needs biological inheritances and those from different socio-economic backgrounds who are usually represented in one class.

Medley (1979) observes that the effective teacher has the command of a large repertoire of competencies, ie skills, abilities, knowledge and so forth which contribute to effective teaching and it is the teacher who produces permanent changes in his pupils who deserve to be called effective teacher. These changes can be achieved by the selection of appropriate techniques to suit different learning situations.

As evident from the background information already being discussed, instructional possibilities for teaching and learning psycho-motor skills range from a single technique to the combinations of two or three methods. Their effectiveness will depend upon the appropriateness of each method used for the skill to be learnt, the ability of the learner to comprehend and the quality of feedback given to the learners. Therefore, this study was designed to ascertain the most effective instructional strategies for acquiring some particular psycho-motor skills in associated with four sports.

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The instructional strategies tested were:

a. Demonstration with verbal feedback - method i

b. Verbal description with verbal feedback - method 2

c. Demonstration, proprioceptive awareness with verbal feedback - method 3

d. Verbal description, proprioceptive awareness with verbal feedback - method 4

e. Combination method (comprising demonstration, verbal description, proprioceptive awareness with verbal feedback - method 5

The gross motor skills used as dependent variables and their categories included:

Skills	Categories
i) Continous volleying in volleyball	- A continuos skill
ii) Zig-zag dribbling round 10 obsticles	- A continuos skill
iii) Headstand in gymnastics -	- A discrete skill
iv) Sail long jump in athletics	- A serial skill

As most of human learning and performance improvement depends on external feedback, tendered by someone, verbal feedback which were the same for each group were offered to the subjects as it was considered that the precision and accuracy of knowledge of results are crucial at all stages of learning.

Methodology

The experimental sample comprised of one hundred and fifty form two students, selected from a typical Nigeria Secondary school. The subjects average age was thirteen years and of both sexes. The sample was divided into five with each having an equal number of girls and boys.

Five instructional methods were tested on the acquisition of four psycho-motor skills associated with four physical sports. Each group utilized a specified instruction for the learning of the four sports skills. Instructions were spread over a period of twenty weeks, (five weeks of two

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double periods a week). Pretests were given at the begining of the experiment to evaluate the entering behaviour and the skill level of the subjects. Post-tests were administered at the end of each skill learning experiences and on the fifth week of each treatment.

The scoring criteria of the subjects are skill-based. For the sail long jump, an athletic skill, assessment was based on body co-ordination, action co-ordination, body position in flight, landing and success.

For headstand in gymnastics, assessment was based on co-ordination, body management, body allignment, continuity in motion and success.

For zig-zag dribbling, assessment was based on ball and stick control, body management, body allignment in motion, continuity in motion with a good demonstration of split vision, and manoeuvring time.

For volleying, the skill rating was on ball control, co-ordination, body allignment, touch of the ball and success.

The skills were assessed by trained judges. 10 points were the highest scores awarded for excellent performance 8 for very good, 6 for average, 4 for below average and 2 was recorded for poor performances.

All the five instructional groups learnt all the four skills and the results which were the scores recorded at the end of the fifth week on each skills, and which were based on their improvement of the skills were tested and analysed using analysis of covariance (Ancova), analysis of variance (Anova) and Q factor statistics. Ancova was used to determine whether the five instructional methods were effective for learning the skills or not. While the Q. factor analysis were used to detect the most effective instructional method in learning the skills, which allowed for comparative analysis. Using sex and instructional methods as the two factors. Because of the limited space available for this presentation only a selected data would be presented.

Discussion on Results

The study investigated the effectiveness of five different instructional methods on the learning of selected psycho-motor skills to discover whether any particular method of instruction was consistently the most effective for the teaching and learning of all categories of gross-motor skills. If however no singlar strategy could be determined, to find out which one of the methods could be most effective for the learning of each tested skill. The five instructional strategies were employed as treatments for sports and the general null hypothesis was that there would be no significant difference between the effectiveness of different instructional treatment conditions in the learning of each of the four skills namely volleying, zig-zag dribbling, a skill in hockey, handstand, a skill in gymnastics and sail long jump, a skill in athletics.

The results obtained for volleying, and zig-zag dribbling revealed a significant difference in the effectiveness of the five instructional strategies at 5 per cent level. The combination method (method 5) was found to be the least effective for volleying, it was ranked second best in effectiveness for the skill in hockey. The other three methods had a relatively equal effectiveness for the learning of volleying skill. Verbal description, proprioceptive awareness with verbal feedback (method 4) was recorded as being the least effective method for the learning of zig-zag dribbling in hockey.

These findings were in support of the claim by Cratty (1968), (1969), and Ilemer (1978)that the combination method was considered the most effective method for teaching physical skills Pohl, (1972), Thaxton et al (1977) and Roberts (1978) also came out with similar findings. As the two skills are associated with team sports, the findings of this research have implication for teachers of team sports. It gave the impression that a

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large group will benefit more from a combination method of instruction Than a single method.

The result of demonstration which was found the least effective for the skill on volleyball was contrary to the findings of LawTher (1968) Fitts and Posner (1967) and Siedentop (1976) Which found the demonstration method to be the most effective means of teaching skills to learners.

The results obtained for headstand in gymnastics and sail long jump in athletics revealed a significant performance improvement on the skills learnt compared with the pretest scores but there was no significant difference in effectiveness between the five instructional methods. With this result it could be concluded that any of the five instructional strategies could be successfully itilized for teaching/learning of both skill. This result confirmed Knapp and Dixon (1952) and Ikulayo (1985) findings as they did not find any significant differences in their subjects when their performances on skills learning were compared with other instructional techniques. (tables 1 - IV).

The Effect of the Sex Factor

A two-year factorial analysis of variance used revealed that both sex and methods of instruction severally and jointly affected performances of the subjects. Their effects were prominent on the significant difference between the mean scores of boys and that of girls on all the five instructional strategies, (table V).

Boys performances were superior to girls when comparison was made between means scores of each of all the instructional methods.

On volleying, the boys performed better with method 4 while girls performance was enhanced by method 3. Thus different methods were considered most effective for the sexes on the learning of the same skill. The method that was least effective for boys was found to be the most effective for girls, and there was not interaction effect.

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On zig-zag dribbling in hockey, boys generally performed better than girls across all methods. The result also showed That method 3 was most effective for both sexes, while method 2 was the least effective for both of them. There was an interaction effect of the two factors at 5 per cent level of significant. The methods have the same effects on the sexes in their movement output for zig-zag dribbling, (graph I).

On the learning of headstand in gymnastics the boys performances were superior to that of girls, and generally performed better than girls on all the five methods when the mean scores of the two groups were compared. These performances for boys were also relatively similar across the five methods which means that each method was equally effective for boys in learning skill. No single method emerged as the most effective.

Girls results were slightly different, as method 3 was recorded the most effective for learning the skill after which all the remaining methods had equal effectiveness for acquiring the skill of headstand. There was no interaction effect of the two factors on the learning of the skill. The result on the learning of sail long jump in athletics revealed that method 5 recorded the highest effectiveness for both sexes. All the other methods had a relatively equal effectiveness for both sexes, except for method 1 which was second best for girls.

In summary, girls recorded better response on volleying on method 3 and 5 while boys responses were better on method 4. On zig-zag dribbling, girls responses were better on method 3 while boys performed better, also on method 3. On headstand, Girls output were slightly better on method 3 while boys did better on methods 4 and 5. On sail long jump, girls performed better on methods 5 and 1 while boys recorded better output on method 5 only. Girls recorded higher output on instlructional strategies on eleven cases while boys better attention on instructional strategies was recorded nine

out of twenty cases when using the Q. factoranalysis, (table VI).

CONCLUSIONS

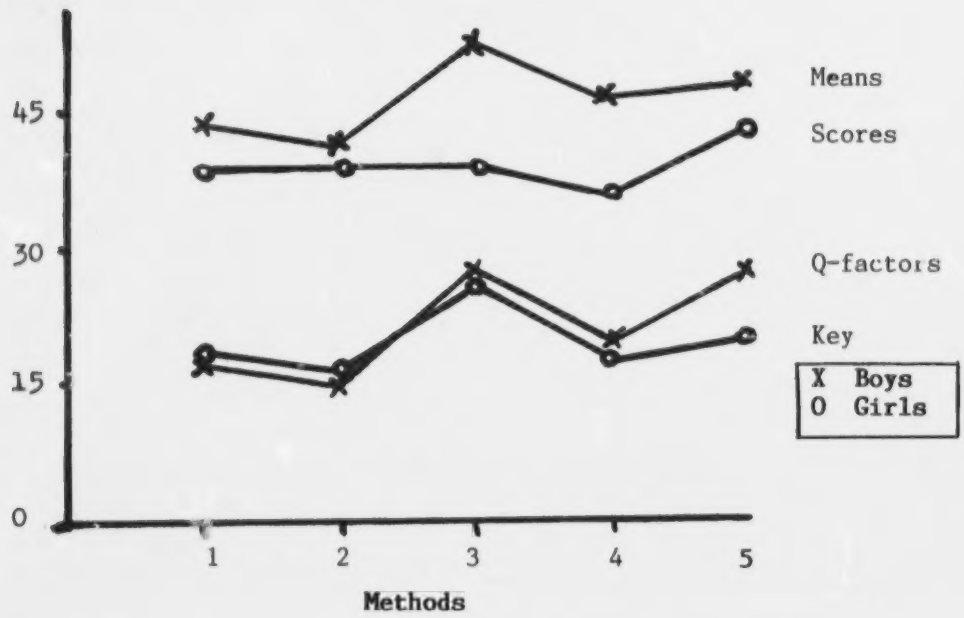
It was obvious that no one method was found to be exclusively most effective for the teaching and learning of all the four selected psycho-motor skills, but, the combination model was slightly favoured and girls seemed to have done better with method 3. However, it was evident that psycho-motor skills are acquired through different instructional strategies. The effectiveness of each of the five instructional methods utilized for the study differ considerably for each skill and sex.

The performance difference between the two sexes was definitely as a result of verbal feedback, sex factor and that of instructional strategies combined. Instructional methods with adequate verbal feedback favoured girls performance. This was revealed in the analysis of the Q. factors for the determination of the effectivess of each instruction. Though boys performed better on general learning output when the mean scores were considered but the influence of instructions had greater effect on the girls than boys.

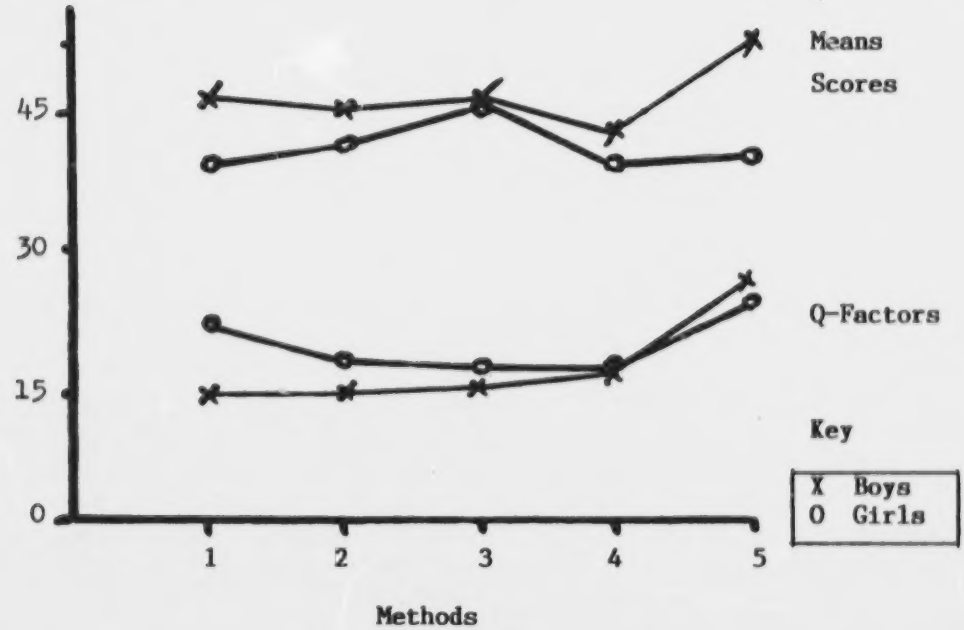
Performance of boys was obviously influenced by factors other than instructions and feedback. For example strength or general motor ability, but these were not specifically tested at any stage of this experiment.

The most significant finding of this study was that the method of instruction that was found most effective for boys were not in all cases found to be so for girls in learning the selected sports skills. It is therefore recommended that sports skills should be taught on sex bases, and that teachers should always vary their methods of instructions from time to time. They should also bear in mind that the combination method stands a greater chance of benefitting a large group as found in team sports than a single method persistently utilized.

Graph 1: Graph showing interaction between sex factor and methods effect for dribbling in Hockey



Graph 2: Graph showing interaction between sex factor and methods effect for sail long jump



RESULTS

Table I One-way Anova table on adjusted posttest scores for volleying in volleyball.

Source of Variation	Sum of squares	of	Mean Square	F. C	F table	Significance
Total	3142.9	148				
Method of Instruction	385.5	4	70.9	3.6	2.37	
Residual	2820.5	144	19.6			

P = .05
Significant at 5% level.

Table II. One - way Anova table on adjusted posttest scores for zig-zag dribbling in hockey.

Source of Variation	Sum of squares	of	Mean Square	F. C.	F. table	Sign.
Total	656.5	148				
Method of Instruction	42.5	4	10.6	2.5	2.37	
Residual	613.9	144	4.3			

Significant at P = 0.05 level.

Table III: One way Anova table on adjusted posttest scores for headstand.

Source of Variation	Sum of squares	of	Means Squares	F. C.	F. table	Sign.
Total	18899.0	148				
Methods of Instruction	997.8	4	249.45	2.0	2.37	N/S.
Residual	17881.1	144	124.17			

N/S. Not. significant.

Table IV: One-way Anova table on adjusted posttest scores for sail long jump.

Source of Variation	Sum of squares	of	Means Squares	F. C.	F. table	Sign.
Total	1801.0	148				
Methods of Instruction	98.1	4	24.5	2.07	2.37	N/S.
Residual	1702.9	144	11.825			

N/S. Not. significant.

Table V. Means Difference for all Psycho-motor skills and instructional Methods for both sexes.

		Instructional Methods.				
Skills	Sex	1	2	3	4	5
Volleying	Boys	16.9	15.9	12.9	17.0	15.6
	Girls	11.5	13.3	10.6	12.6	13.7
zig - zag dribbling	Boys	14.5	13.9	17.6	15.4	15.9
	Girls	12.9	12.9	12.9	11.9	14.2
Headstand	Boys	12.4	13.5	13.8	17.6	13.8
	Girls	10.0	9.9	10.6	12.4	11.1
Sail long Jump	Boys	15.5	15.2	15.5	14.4	17.7
	Girls	13.3	13.9	15.4	13.1	13.4

Table VI. Q. Factor comparison between the two sexes on all instructional Methods and all four skills.

		Instructional Methods.				
Skills	Sex	1	2	3	4	5
Volleying	Boys	5.1	4.5	3 .7	5.5	4.1
	Girls	4.2	4.2	5.5	3.7	4.3
zig - zag dribbling	Boys	5.7	4.8	8.8	6.3	8.8
	Girls	6.0	5.3	8.5	5.7	6.5
Headstand	Boys	2.5	2.0	2.2	2.7	2.6
	Girls	3.2	3.5	4.1	2.1	2.5
Sail long Jump	Boys	4.8	4.8	5.0	5.5	8.5
	Gitls	7.4	5.9	5.7	5.6	8.0
Total	Boys: 9 cases of Higher scores than girls.			Girls: 11 cases of Higher scores than boys		

— to sho. effectiveness of each treatment.

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